

On page 2, in paragraph 2 of the Office Action, Figures 1, 2 and 5-7 were objected to. The Letter to the Examiner Requesting Approval of Drawing Changes enclosed herewith obviates the objection. FIGS. 1 and 2 were not amended, as they are general diagrams that can show various embodiments of the invention. Reconsideration and removal of the objection is respectfully requested.

On page 2, in paragraph 3 of the Office Action, the drawings were objected to as not complying with 37 CFR §1.83(a). The objection is respectfully traversed. 37 CFR §1.83(a) states, "the drawing in a nonprovisional application must show each and every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation." Claims 2, 23 and 30 depend on claims 1, 22 and 29 respectively, and therefore the feature is not present in every embodiment of the invention. Therefore, the display unit does not need to be shown in the drawings for a proper understanding of the invention. This feature is supported and described in the written specification. Reconsideration and withdrawal of the objection is respectfully requested.

On page 2, in paragraph 4 of the Office Action, the title was objected to. The title has been amended to obviate the objection. Reconsideration and removal of the objection to the title is respectfully requested.

On page 3, in paragraph 6 of the Office Action, claim 15-21 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 5,933,341 to Kuriyama et al. The rejection is respectfully traversed.

Kuriyama teaches a power converting apparatus where a control means judges whether an abnormal operation is present based upon the power output V_0 detected by the voltage detecting circuit becoming an intermediate electric potential when the switching semiconductor elements 51a and 51b on the three phase alternating circuit are simultaneously turned on. It is only possible to apply this means to a synchronous rectifying circuit. Because in a synchronous rectifying circuit, output voltage V_0 constantly indicates a certain definite power output (a voltage output value). When both switching elements are simultaneously turned on, the output voltage indicates 0 volts. Consequently, it is simple to detect the simultaneous on timing of the switching elements of Kuriyama. However, in the claimed DC-DC converter having a main switch and a synchronous rectifying switch, it is not sufficient to know that the voltage between only the lower

arm switching elements has become 0 volts or to detect the direction of the electric current. Therefore, Kuriyama can neither teach nor anticipate “a detection circuit for detecting a state that said main switch and said synchronous rectifying switch are simultaneously turned on” as recited in claim 15.

Claims 16-21 are allowable as depending on claim 15, as well as for the additional features recited therein. Reconsideration and withdrawal of the rejection of claims 15-21 under 35 USC §102 is respectfully requested.

On page 3, in paragraph 7 of the Office Action, claims 1-14 and 22-35 were rejected under 35 USC §103(a) as being unpatentable over Kuriyama et al. in combination with U.S. Patent No. 5,646,837 to Weggel. The rejection is respectfully traversed.

Weggel teaches a circuit for preventing simultaneous turning on of Q_1 and Q_2 by coupling L1 and L2 or L2 and L4. Although Weggel's method is successful to avoid simultaneous turning on of timing, this is a different control method and apparatus from that of the claimed invention. Therefore, Weggel does not solve the deficiencies noted above with respect to Kuriyama. Specifically, neither Kuriyama nor Weggel, either alone or in combination, teaches “a detection circuit for detecting a state that said main switch and said synchronous rectifying switch are simultaneously turned on” as recited in claim 1.

Claims 8, 22 and 29 are allowable for reasons similar to those discussed above in relation to claim 1. Claims 2-7, 9-14, 23-28 and 30-35 are allowable as depending on claims 1, 8, 22 and 29 respectively, as well as for the additional features recited therein. Reconsideration and withdrawal of the rejection of claims 1-14 and 22-35 under 35 USC §103(a) is respectfully requested.

On page 4, in paragraph 8 of the Office Action, claims 36-40 were rejected under 35 USC §103(a) as being unpatentable over Kuriyama in combination with Weggel as applied above in further combination with any one of U.S. Patent No. 3,376,492 to Morgan et al. or U.S. Patent No. 6,175,511 to Ooba. The rejection is respectfully traversed.

Ooba teaches how to ensure power is supplied in an uninterruptible power supply system, even when the power needed is greater than the power supplied by the AC power input. Ooba neither teaches nor suggests “a detection circuit for detecting a state that said first switch and said second switch are simultaneously turned on” as recited in claim 36. Therefore Ooba does not solve the deficiencies noted above in relation to Kuriyama and Weggel.

Morgan teaches a tapped linear inductor that is applied across a pair of power supply terminals that are adapted to be connected across a source of electric potential. Morgan neither teaches nor suggests "a detection circuit for detecting a state that said first switch and said second switch are simultaneously turned on" as recited in claim 36. Therefore Morgan does not solve the deficiencies noted above in relation to Kuriyama and Weggel.

Claims 37-40 are allowable as depending on claim 36, as well as for the additional features recited therein. Therefore, neither Morgan nor Ooba solves the deficiencies noted above in relation to Kuriyama and Weggel. Therefore, no combination of Kuriyama, Weggel, Morgan and Ooba can either teach or suggest the claimed invention. Reconsideration and withdrawal of the rejection of claims 36-40 under 35 USC §103 is respectfully requested.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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